

**YAESU**  
The radio

C4FM FDMA  
144/430 MHz DUAL BAND DIGITAL TRANSCEIVER

# FT1DR/FT1DE



ACTUAL SIZE

<http://www.yaesu.com/>

# Digital C4FM

## Exciting new amateur digital transceiver

### 144/430 MHz DUAL BAND DIGITAL TRANSCEIVER

### FT1DR/FT1DE



BLACK

SILVER

C4FM FDMA 144/430 MHz DUAL BAND  
5W DIGITAL TRANSCEIVER

# FT1DR

# FT1DE

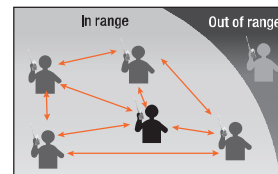
American and Asian versions

European version

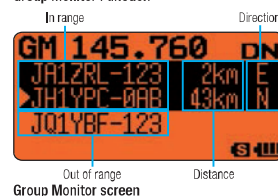
(7.4V 1100 mAh Lithium Ion Battery FNB-101LI and battery charger PA-48 / SAD-11B(USA version) included)

#### Digital Group Monitor (GM) Function

The digital GM function automatically checks whether members registered in a group are within communication range, and displays information such as distance and direction for each call sign on the screen. This convenient function makes it possible not only to see whether any friends are in communication range, but also to instantaneously determine the location and relationship between all members of the group. This function can also be used to send messages and data such as images between members of a group, permitting convenient and fun communication between friends when out for a drive or hike. Sent and received messages and images can be checked on the LOG List screen, with icons making them easy to distinguish.



Group Monitor Function



Group Monitor screen



Icon display  
LOG list screen

#### Snapshot Function

When using the handy speaker microphone camera (optional MH-85A11U), press the shutter button to capture a snapshot, then press the image transmit button to easily transmit the image data. The snapshot image or received data is stored in a high capacity micro SD card that is installed in the radio. You can recall and send that image data from the SD card anytime. The image data size is 320 x 240 dots or 160 x 120 dots. Image quality can set from 3 types, and you can choose a format that is suitable for the image and purpose. This image data also retains a time record and the GPS location data of the snapshot. It is easy to view and edit the data file after taking the pictures by using a personal computer. A snapshot aids in navigating and returning to the pictured location, other various uses are possible.



Lens



Image transmission  
button

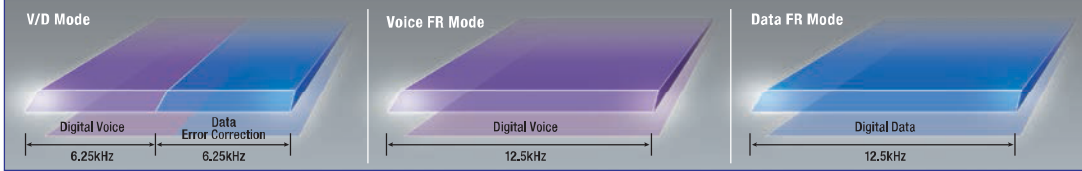
Shutter button



## 4 Communication Modes

The FT1DR/FT1DE operates in three digital modes and an analog mode. Enjoy communication in the mode that suits each purpose.

### 12.5kHz FDMA Digital Communication



#### 1. V/D Mode (Simultaneous Voice/Data Communication Mode)

Half of the bandwidth is used for voice signal with error correction. The transceiver uses powerful error correction technology developed for professional communication devices. The very effective error correction code provides benefits such as minimal interruption of communication. The basic digital C4FM FDMA mode provides a good balance between sound quality and error correction.

#### 2. Voice FR Mode (Voice Full Rate Mode)

This mode uses the entire 12.5 kHz bandwidth to transmit digital voice data. The larger voice data size allows voice communication with high quality. Use this mode for pleasing sound quality communication between amateur radio friends.

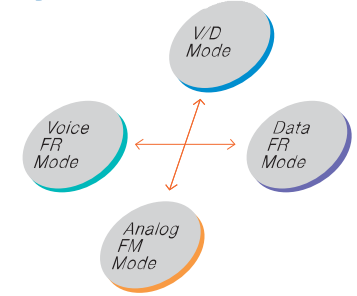
#### 3. Data FR Mode (High-speed Data Communication Mode)

This mode uses the entire 12.5 kHz bandwidth for data communication. The transceiver automatically switches to this mode when sending and receiving images, allowing a large amount of data to be transmitted quickly.

#### 4. Analog FM Mode

Analog FM is effective for communication with a weak signal that causes voices to break up in the digital modes. The analog mode allows communication even at distances where noise and weak signals make communication almost impossible. The tried-and-trusted low-power circuit design uses less battery power than the digital modes.

### The Automatic Mode Select (AMS) function detects the receive signal mode

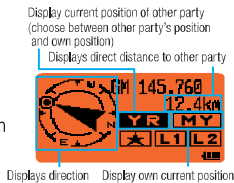


The transceiver automatically selects one of the four communication modes according to the signal received. This is extremely convenient when listening for communications, as you do not need to be aware of the other party's communication mode. The transceiver can also be operated in a fixed communication mode.

## Smart Navigation Function

### A real-time navigation function that records the location and direction of Group Monitor (GM) stations.

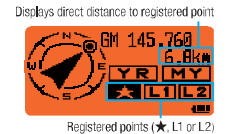
Digital V/D Mode communicates information such as position data at the same time as the voice signal, allowing you to view the distance and direction of the other party in real time while communicating. This makes it possible to confirm your position and the other party's in situations such as hiking and driving where your positions are constantly changing, providing an easy way to meet up or join routes.



### Backtrack Function to Return to Departure Point

This function allows navigation back to the departure point, or a point previously added to the memory.

When hiking or camping, just register the starting point or the position of your tent and then you can constantly check the direction and distance from your current position. The arrow of the compass display constantly shows the direction to the registered point, making it extremely convenient in finding your way back to the registered place – just move in the direction so that the arrow in the heading-up display points straight upward.



## Abundant functions for easy operation

### Extremely user-friendly with intuitive and easy-to-master operations

The FT1DR/FT1DE is extremely user-friendly, with a wide range of functions that can be called up directly. An easy-to-understand hierarchical menu is also used for the setting modes that allows customization of the FT1DR/FT1DE and makes it convenient to use. Press the ENT key to move to a lower level of the hierarchy, press the DISP key to return to a higher level, and turn the dial to select items or set values. These simple operations can be used to adapt the FT1DR/FT1DE to many communication situations.

### Wideband Receive capability

Covers 504 kHz - 999.900 MHz (A Band), 108 MHz - 580 MHz (B Band), continuous reception for short-wave, FM/AM broadcasts, aircraft, public service channels, etc.

### Real Dual Band Operation (V+V/U+U/V+U)

With two independent receivers, you may listen to either the same or a different band simultaneously.

### Preset Receiver Function with an Extensive Range of Major Broadcasting Stations and Various Wireless Information Services

The FT1DR/FT1DE has a preset receiver function with various frequencies in memories, making it easy to call up stations in the various communication services. The frequencies include short-wave broadcasts, international (marine) VHF and NOAA Weather channels. The display tags are shown in easy-to-read letters.

### 1200/9600bps APRS® Data communication

The built-in worldwide standard AX.25 Data TNC Modem permits uncomplicated APRS® (Automatic Packet Reporting System) operation. You will be able to display the information, station list; and use the message, SmartBeaconing™ function. You will be able to track your APRS® movement on the Internet websites.

#### APRS®Display

FT1DR/DE displays the positions, heading directions of the station, distances, icons (45 kinds), weather information, object, etc.



#### APRS®List

The station List function stores up to 60 stations with the individual APRS® data



### AF Dual

Listen to AM or FM radio stations while monitoring two frequency channels! Two independent receivers will allow you to listen to your favorite AM or FM broadcast station, and monitor two different bands ("Band A" and "Band B") at the same time.

### Micro SD card slot

The micro SD card slot is provided on the side of the radio. Memory back-up, the picture image data and other useful information is stored on the high capacity micro SD card (Maximum 32GB). The GPS logger records the location and track information of your moving station, which may be shown later by using Map software on your personal computer. By using the SD card, it is also possible to clone the radio data to the other compatible radios.



### Built-in GPS Antenna on the top

Integral GPS receiver and antenna provides location, time, direction and APRS® information.



### Water protection IPX5 Rating

Fully ruggedized and water protected (IPX5) design. Perfect for extreme environments, field and outdoor use.

### Data Terminal for data communication

A Data terminal is located on the side of the radio. The optional camera equipped microphone (MH-85A11U) may be connected to this terminal. Your Personal Computer may also be connected to this terminal to transfer the data or update the firmware of the radio.

### High Power and long life Operation

Up to 5 watts of power output and rugged compact body, 4 steps of power output, 5 watts, 2.5 watts, 1 watt and 0.1 watt. There are two types of Li-Ion battery. The optional FNB-102LI battery will provide up to 8 hours of typical 5 watt operation.

#### Battery Operating Times (Approximately)

Band • Mode	FNB-101LI	FNB-102LI	Battery Case FBA-39(0.8W)
144MHz	Analog Mode	5 hours	8 hours
	Digital Mode	4 hours	6.5 hours
430MHz	Analog Mode	4.5 hours	7.5 hours
	Digital Mode	3.6 hours	6.0 hours

\* Duty Cycle based on Tx 6 sec., Rx 6 sec., Standby 48 sec.

(Tx Power 5 Watts, Rx audio output 10%THD, Battery save 1:5, Monoband receive, and GPS function off.)

\* Operating times may vary depending on operating conditions.

## Many additional features

•Large-capacity 1266 ch memory and twenty-four 100ch memory banks •Fully illuminated keyboard that will permit easy operation in dark environments. •High resolution band-scope with  $\pm 50$  channels •Three types of Vibrate Alert function •High-Intensity White LED and illumination function •Internal Bar Antenna for AM broadcast band reception •Memory TAG up to 16 characters •Built-in CTCSS, DCS, new Pager function encode/decode enables Selective call features •DTMF Encode •DTMF Memory •Built-in highly accurate 24-hour Clock by GPS receiver •Built-in On/Off Timer, Automatic Power Off (APO) and Time-out Timer (TOT) •Versatile Scanning for the Monitoring Enthusiasts. •Built-in Temperature Sensor •GPS data transmission feature •External DC input •Useful Battery saving features •Password Lock function

## FT1DR/FT1DE SPECIFICATIONS

### General

Frequency Range A (Main) Band RX: 0.5 - 1.8 MHz (AM Radio)  
1.8 - 30 MHz (SW Radio)  
30 - 76 MHz (50 MHz HAM)  
76 - 108 MHz (FM Radio)  
108 - 137 MHz (Air Band)  
137 - 174 MHz (144 MHz HAM)  
174 - 222 MHz (VHF Band)  
222 - 420 MHz (GEN1)  
420 - 470 MHz (430 MHz HAM)  
470 - 800 MHz (UHF Band)  
800 - 999 MHz (GEN2, Cellular Blocked)  
B (Sub) Band RX: 108 - 137 MHz (Air Band)  
137 - 174 MHz (144 MHz HAM)  
174 - 222 MHz (VHF Band)  
222 - 420 MHz (GEN1)  
420 - 470 MHz (430 MHz HAM)  
470 - 580 MHz (UHF Band)  
TX: 144 - 146 MHz or 144 - 148 MHz  
430 - 440 MHz or 430 - 450 MHz  
Channel Steps: 5, 6.25, 8.33, 9, 10, 12.5, 15, 20, 25, 50, 100 kHz  
(8.33 kHz : only for Air band, 9 kHz : only for AM Radio)  
Frequency Stability:  $\pm 2.5$  ppm  $-4^{\circ}\text{F}$  to  $+140^{\circ}\text{F}$  ( $-20^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$ )  
Emission Type: F1D, F2D, F3E, F7W  
Supply Voltage: Nominal: 7.4 V DC, Negative Ground  
Operating: 4 - 14 V, Negative Ground (EXT DC JACK)  
11 - 16 V, Negative Ground (EXT DC JACK with E-DC-5B)  
7.4 V DC (Negative Ground)

Current Consumption: 150 mA (Mono band Receive)  
220 mA (Dual band Receive)  
100 mA (Mono band Receive, Standby)  
150 mA (Dual band Receive, Standby)  
45mA (Mono band Receive, Standby, Saver On "Save Ratio 1:5")  
45mA (Dual band Receive, Standby, Saver On "Save Ratio 1:5")  
+30mA (GPS On)  
+65mA (Digital)  
600 $\mu\text{A}$  (Auto Power Off)  
1.7 A (5 W TX, 144 MHz 7.4 V DC)  
2.0 A (5 W TX, 430 MHz 7.4 V DC)

Operating Temperature:  $-4^{\circ}\text{F}$  to  $+140^{\circ}\text{F}$  ( $-20^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$ )  
Case Size: 2.4"(W)  $\times$  3.7"(H)  $\times$  1.1"(D) (60  $\times$  95  $\times$  28 mm)  
(w/o knob, antenna, & belt clip)  
Weight (Approx.): 9.35 oz (265 g) with FNB-101LI & Antenna

### Transmitter


RF Power Output: 5 W (@ 7.4 V or EXT DC)  
Modulation Type: F1D, F2D, F3E: Variable Reactance modulation  
F7W: 4 FSK (C4FM)  
Spurious Emission: At least 60 dB below (@TX Power Hi, L3, L2)  
At least 50 dB below (@TX Power L1)

### Receiver

Circuit Type: AM, NFM: Double-Conversion Super heterodyne  
AM/FM Radio: Single-Conversion Super heterodyne  
Intermediate Frequencies: 1st: 47.25MHz (AM, NFM A Band)  
1st: 46.35MHz (AM, NFM B Band)  
2nd: 450 kHz (AM, NFM)  
1st: 130 kHz (AM/FM Radio)  
Sensitivity: 3  $\mu\text{V}$  for 10 dB SN (0.5 - 30 MHz, @AM)  
0.35  $\mu\text{V}$  TYP for 12 dB SINAD (30 - 54 MHz, @NFM)  
1  $\mu\text{V}$  TYP for 12 dB SINAD (54 - 76 MHz, @NFM)  
1.5  $\mu\text{V}$  TYP for 12 dB SINAD (76 - 108 MHz, @WFM)  
1.5  $\mu\text{V}$  TYP for 10 dB SN (108 - 137 MHz, @AM)  
0.2  $\mu\text{V}$  for 12 dB SINAD (137 - 140 MHz, @NFM)  
0.16  $\mu\text{V}$  for 12 dB SINAD (140 - 150 MHz, @NFM)  
0.2  $\mu\text{V}$  for 12 dB SINAD (150 - 174 MHz, @NFM)  
1  $\mu\text{V}$  for 12 dB SINAD (174 - 222 MHz, @NFM)  
0.5  $\mu\text{V}$  for 12 dB SINAD (300 - 350 MHz, @NFM)  
0.2  $\mu\text{V}$  for 12 dB SINAD (350 - 400 MHz, @NFM)  
0.16  $\mu\text{V}$  for 12 dB SINAD (400 - 470 MHz, @NFM)  
1.5  $\mu\text{V}$  for 12 dB SINAD (470 - 540 MHz, @NFM)  
3  $\mu\text{V}$  TYP for 12 dB SINAD (540 - 800 MHz, @NFM)  
1.5  $\mu\text{V}$  TYP for 12 dB SINAD (800 - 999 MHz, @NFM, Cellular Blocked)  
0.19  $\mu\text{V}$  TYP for BER 1% (Digital Mode)  
Selectivity: NFM, AM 12 kHz / 35 kHz (-6 dB / -60 dB)  
AF Output: 200 mW (8  $\Omega$  for 10 % THD 7.4 V)  
400 mW (8  $\Omega$  for 10 % THD 13.8 V)

\*APRS® is a registered trademark of Bob Bruninga, WB4APR, SmartBeaconing™ from HamHUD Nicetronics.

## OPTIONS

 Speaker Microphone with Snapshot camera <b>MH-85A11U</b>	 Speaker / Microphone <b>MH-34B4B</b>	 Earpiece Microphone <b>MH-37A4B</b>	 VOX Headset <b>VC-25</b>	 Microphone Adapter <b>CT-44</b>	 Lithium Ion Battery Packs(7.4V 1100 mAh) <b>FNB-101LI<sup>1</sup></b>
 Lithium Ion Battery Packs(7.4V 1800 mAh) <b>FNB-102LI</b>	 Battery Charger <sup>1</sup> <b>SAD-11B, PA-48B/C/U<sup>2</sup></b>	 Rapid Charger <b>CD-41</b>	 3x"AA"Cell Battery Case <b>FBA-39</b>	 PC Connection Cable <b>SCU-18<sup>1</sup></b>	 Data Cable <b>CT-170</b>
 Data Cable (2.5 $\phi$ ) <b>CT-176</b>	 Clone Cable <b>CT-168</b>	 DC Cable <b>E-DC-6</b>	 DC Cable w / Noise Filter <b>E-DC-5B</b>	 BNC-to-SMA Adapter <b>CN-3</b>	 Soft Case <b>CSC-97</b>

<sup>1</sup>The same as the supplied accessory <sup>2</sup>SAD-11B for USA version / PA-48B for 120VAC / PA-48C for 220-240 VAC / PA-48U for 230 VAC-UK Plug

About this brochure: We have made this brochure as comprehensive and factual as possible. We reserve the right, however, to make changes at any time in equipment, optional accessories, specifications, model numbers, and availability. Precise frequency range may be different in some countries. Some accessories shown herein may not be available in some countries. Some information may have been updated since the time of printing; please check with your Authorized Yaesu Dealer for complete details.

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